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27. (New) A projection exposure apparatus, comprising:

a projection optical system for projecting a pattern of a first object onto a second object;

a first illumination system for illuminating the pattern of the first object under a first illumination condition, wherein the pattern of the first object illuminated under the first illumination condition is projected onto the second object through said projection optical system;

a second illumination system for illuminating the first object under a second illumination condition;

a light intensity detector for detecting a light intensity distribution of an image, formed through said projection optical system, of the pattern of the first object illuminated under the second illumination condition; and

an information processing system operable to measure wavefront aberration of said projection optical system on the basis of the detection by said light intensity detector;

wherein the first and second illumination conditions have different spatial coherencies.

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28. (New) A device manufacturing method, comprising the steps of:

transferring, by projection exposure, a pattern of a reticle onto a wafer with use of a projection exposure apparatus according to Claim 21 or 22; and

developing the exposed wafer.



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